

THE LATER HISTORY OF A CASE OF FOCAL EPILEPSY FOR WHICH TREPHINING AND EXCISION OF THE MOTOR CENTRES WERE PERFORMED.¹

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AT the meeting of this association held in Washington, in September last, I reported with Dr. John B. Deaver, a case of focal epilepsy which had been observed and studied in my wards in the Philadelphia Hospital, and in which Dr. Deaver had operated. The case was reported² as successfully treated by trephining and excision of the motor centres. At the time of this report three months had elapsed without the patient having suffered a return of his convulsions, although before the operation he had had daily a series of epileptic attacks numbering from fifteen to twenty-eight. In the discussion of this case, which followed the reading of the report, Dr. David Ferrier, of London, said, in effect, "that while such cases were of interest and value it was, as yet, too soon to claim that the case was permanently cured." He referred to a case of his own in which a similar operation had very much diminished at first the number of epileptic seizures but had not permanently abolished them. In closing this discussion I promised to report the subsequent history of our case if the patient's convulsions returned, and in accordance with this promise I have prepared the following notes :

It may be well to refer briefly to the symptoms in this case and to the operative procedures. The patient was a man, aged about 35, who had had epileptic fits for fourteen years. These fits were ushered in by a sensory aura running from

¹ Read at the meeting of the Am. Neu. Ass'n, Long Branch, June, 1889

² American Jour. Med. Sciences, November, 1888.

the index finger of the left hand. The signal motor symptoms were twitching of that finger, rapidly followed by convulsive movements in the left arm and in the left face. These parts were sometimes alone involved, with slight, if any, loss of consciousness; while at other times the fit became almost general, but always worse on the left side, with greater loss of consciousness. In the intervals between the attacks the fore and middle finger and the muscles of the left face were quite perceptibly paretic. The operation consisted in exposing the middle and lower portions of the ascending frontal and parietal convolutions and in removing the portions of these convolutions which were found by direct faradic stimulation to preside over flexion of the fingers and contraction of the face muscles, no other method being adopted to find these but the use of faradism.

After the operation the patient had no convulsive seizures, except a very few minor attacks during the first few days, up to the time when the report was made—a period of three months. Paresis of the left fore and middle finger and of the left face persisted.

A few weeks after this date the patient was reported by the attendants to have had an epileptic seizure. He confirmed this report himself. From that time up to his departure from the hospital, six months later, he had ten more seizures. The character of these attacks, as far as I could make it out from the reports of attendants and the patient himself, was very similar to what it had been before the operation; the sensory aura and the rather localized nature of the fits, with only partial loss of consciousness, being apparently the same. These return seizures were nearly always nocturnal, so they were not observed by any person trained in observation. The chief and resident physicians never had an opportunity to observe them—so the record rests entirely upon unskilled, but apparently authentic, observation.

The patient suddenly left the hospital and has not been heard of since. He was seen once subsequently by the writer, riding a horse bare-back on Market Street, West Philadelphia—having evidently secured employment at a training and sale stable.

As a result of this operation we have, briefly, a suspension of all epileptic seizures for almost four months; then a return of them at rare intervals up to nine months, when the patient disappears from view. The total number of return seizures during the five or six months of their observation being about ten, which is less than the patient had had often in one day before operative interference.

It is disappointing, however, to have to record the return of any fits whatever and however few, for if this operation, which is based upon such interesting and valuable physiological work, is to endure as a recognized surgical procedure it is obvious that it must furnish results which are complete and beyond criticism. The return of any convulsive symptoms whatever exposes the operation to the suspicion that something more remains to be done, or to the condemnation that nothing more can be done to make the excision a success.

The case suggests to my mind a few ideas which I will state briefly.

Faradic stimulation was relied upon almost entirely to map out the centres presiding over the movements of the face and arm. I noted at the time, and stated so in my report, that some areas of the cortex in immediate contiguity to the areas excised were not excitable at all, at least did not give any muscular response anywhere. In commenting upon this fact in his discussion of Dr. Mills' paper before the Congress, Mr. Horsley said that the substances used in antiseptic surgery—such as the corrosive sublimate—had an effect in diminishing the excitability of the brain cortex to faradic stimulation. At a subsequent operation upon a child, the patient of Drs. Mills and Roberts, this fact appeared to be illustrated. I made the faradic exploration, by the kindness of these physicians, and although a strong current was employed no response anywhere was elicited. The area exposed and faradised was the region presiding over protraction, and also the upper regions of the ascending frontal and parietal convolutions. The patient suffered with epileptic attacks, ushered in by a very marked and characteristic movement of protraction of the arm.

Cortical epilepsy without gross lesion can of course be localized by a strict observance of the principles of cortical localization only as illustrated in the experimental work of the brain physiologists. But these principles are not as yet complete and unalterable, for even the most advanced and enthusiastic of these pioneers will not claim that the science is as yet in more than its early stages of development. It is not therefore strange that surgery in its practical application of this, as yet incomplete, knowledge should not have been able to attain a precision of diagnosis or to elaborate a technique which are infallible. I think these cases, therefore, are of great value for what they teach of success and what they demonstrate of failure. The great desideratum is a more precise knowledge of the limits of the various centres, or special areas, and a method of demarkating them more exact than has been as yet suggested. I think the one defect in our case, and most probably in all cases yet operated upon, was the fact that with the greatest care it was impossible to say that *all* cortical tissue had been removed which presided over the affected muscles. This difficulty is due to several causes. First: it is not easy to recognize definite small areas of brain cortex through a small trephine wound. Second: when recognized it is not easy to define their exact limits; and third, the diffusion of the faradic current to neighboring centres, and the sedative action of antiseptic substances, increase this difficulty still more. Again, the healing process, even under aseptic conditions without the formation of pus and undue adventitious products, may leave a contracting, hyperplastic and irritating scar which possibly causes a return of convulsive seizures after an interval of exemption. This element of mischief has not been dwelt upon with the emphasis it seems to demand. If it is a cause of return spasms, it is difficult to determine how it can be avoided. Frank has claimed that a distinction exists between the spasm produced by irritation of the cortex and of the descending fibres below—stating that in the cortex alone have we the true clonic, epileptiform phenomena, while irritation of the motor-descending fibres produces a spastic reaction. If this is

always so the scar tissue forming after an operation on the cortex involving the white substance beneath, would, it seems, produce a tonic, and not a clonic fit. In our case, however, the return spasms were clonic, and apparently precisely similar to the original attacks. The conclusion would be, that not scar tissue, but unremoved cortex, was the cause of the return. The similarity of the return-seizures has been observed, I believe, by others.